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Services Supply Chain in the Department of Defense: Drivers of Success in Services Acquisition

10 January 2014

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Graduate School of Business & Public Policy

Naval Postgraduate School

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14. ABSTRACT

Over the last few decades, services acquisition has continued to increase in scope and dollars obligated. Contracting for services has grown in relation to systems contracting over the last couple of decades and is the fastest growing procurement sector for the DoD. This growth in dollars obligated has attracted increased political attention and scrutiny on an already problematic defense contracting process. The DoD has responded to these problems by improving services acquisition in several different ways, but even with these improvements services acquisition still has problems in the areas of procurement planning, source selection, and contract administration. This research continues our ongoing investigation in DoD services acquisition by exploring the determinants of contract success. We use the DoD Contractor Performance Assessment Reporting System (CPARS) as a proxy for contract success and determine if there are any relationships between contract variables (type of service, contract dollar value, level of competition, contract type) and contract success based on CPARS ratings (quality of product/service, schedule, cost control, business relations, management of key personnel, and utilization of small business). Our research findings revealed that contract dollar value and level of competition affected the success of a service contract. The findings also revealed that the failure rate in CPARS was lower than expected. Finally, we saw that as the percentage of 1102 filled billets increased, the contract failure rate decreased. We also observed that as workload dollars per filled billet increased, contractor performance ratings also increased, and thus contract failure ratings decreased. From these findings, the report presents a discussion of the results and the managerial implications.

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Abstract

Over the last few decades, services acquisition has continued to increase in scope and dollars obligated. Contracting for services has grown in relation to systems contracting over the last couple of decades and is the fastest growing procurement sector for the DoD. This growth in dollars obligated has attracted increased political attention and scrutiny on an already problematic defense contracting process. The DoD has responded to these problems by improving services acquisition in several different ways, but even with these improvements, services acquisition still has problems in the areas of procurement planning, source selection, and contract administration. This research continues our ongoing investigation in DoD services acquisition by exploring the determinants of contract success. We use the DoD Contractor Performance Assessment Reporting System (CPARS) as a proxy for contract success and determine if there are any relationships between contract variables (type of service, contract dollar value, level of competition, contract type) and contract success based on CPARS ratings (quality of product/service, schedule, cost control, business relations, management of key personnel, and utilization of small business). Our research findings revealed that contract dollar value and level of competition affected the success of a service contract. The findings also revealed that the failure rate in CPARS was lower than expected. Finally, we saw that as the percentage of 1102 filled billets increased, the contract failure rate decreased. We also observed that as workload dollars per filled billet increased, contractor performance ratings also increased, and thus contract failure ratings decreased. From these findings, the report presents a discussion of the results and the managerial implications.

Keywords: Services Acquisition, Services Contracts, Success of Services Contracts

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Dr. Apte's research interests include managing service operations, supply chain management, technology management, and globalization of information-intensive services. He has completed over 10 sponsored research projects for the U.S. Department of Defense and has published over 60 articles, five of which have won awards from professional societies. His research articles have been published in prestigious journals including *Management Science*, *Interfaces*, *Production and Operations Management (POM)*, *Journal of Operations Management (JOM)*, *Decision Sciences Journal (DSJ)*, *IIE Transactions*, and *MIS Quarterly*. He has co-authored two books, *Manufacturing Automation* and *Managing in the Information Economy*. Dr. Apte has served as a vice president of colleges at the Production and Operations Management Society (POMS), as a founder and president of the POMS College of Service Operations, and as guest editor of the POM journal. Currently he serves as the senior editor of *POM* and as associate editor of *DSJ*.

Dr. Apte holds a PhD in decision sciences from the Wharton School, University of Pennsylvania. His earlier academic background includes an MBA from the Asian Institute of Management, Manila, Philippines, and Bachelor of Technology (chemical engineering) from the Indian Institute of Technology, Bombay, India.

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Dr. Rene G. Rendon is a nationally recognized authority in the areas of supply management, contract management, and project management. He is currently on the faculty of the Naval Postgraduate School, where he teaches in the MBA and Master of Science programs. Prior to his appointment at the Naval Postgraduate School, he served for more than 22 years as an acquisition and contracting officer in the United States Air Force, retiring at the rank of lieutenant colonel. His Air Force career included assignments as a warranted contracting officer for the Peacekeeper ICBM, Maverick Missile, C-20 (Gulfstream IV), and the F-22 Raptor. He was also a contracting squadron commander for an Air Force pilot training base and the director of contracting for the Air Force's Space-Based Infrared Satellite System, and the Evolved Expendable Launch Vehicle rocket program.

Rendon has taught contract management courses for the UCLA Government Contracts program; he was also a senior faculty member for the Keller Graduate School of Management, where he taught MBA courses in project management and contract management. He is a graduate of the U.S. Air Force Squadron Officer School, Air Command and Staff College, Air War College, and the Department of Defense Systems Management College. Rendon is Level III–certified in both program management and contracting under the Defense Acquisition Workforce Improvement Act (DAWIA) program. He is also a certified professional contracts manager (CPCM) with the National Contract Management Association (NCMA), a certified purchasing manager (C.P.M.) with the Institute for Supply Management (ISM), and a certified project management professional (PMP) with the Project Management Institute (PMI). He has received the prestigious Fellow Award from NCMA, and he was recognized with the United States Air Force Outstanding Officer in Contracting Award. He has also received the NCMA National Education Award and the NCMA Outstanding Fellow Award. Dr. Rendon is a member of the ISM Certification Committee as well as on the editorial review board for the ISM's *Inside Supply Management* magazine. He is a member of the NCMA board of advisors as well as associate editor for its *Journal of Contract Management.* Dr. Rendon's publications include *Government Contracting Basics* (2007), *U.S. Military Program Management: Lessons Learned & Best Practices* (2007), and *Contract Management Organizational Assessment Tools* (2005). He has also published scholarly articles in *Contract Management* magazine, the *Journal of Contract Management*, *Program Manager* magazine, *Project Management Journal*, and *PM Network* magazine. He is a frequent speaker at universities and professional conferences and provides consulting to both government and industry.

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Dr. Michael Dixon is an assistant professor of operations management at the Graduate School of Business and Public Policy at the Naval Postgraduate School (NPS). He is interested in service operations management and specifically the effect of operational decisions and service design on customer experience. Dr. Dixon conducts management research from an analytical perspective and analyzes large archival data sets to model customer behavior, finding ways to represent the behavioral aspects of service design in quantitative and analytical ways. Specifically, he is interested in understanding the role of experiential sequence on participant perception. In past research, he analyzed season subscription ticket sales for a large performing arts venue and showed that season subscription re-purchases are influenced by event sequences from previous seasons, leading to managerial direction for event planners to properly schedule performances across a season to maximize experiential effects. He teaches managerial statistics to MBA students at the Naval Postgraduate School and has been awarded the Liskin Teaching Award two times in the past two years for his teaching efforts.

Dr. Dixon is a co-editor of the *POMS Chronicle* newsletter and has been asked to serve as a session chair at the Decision Sciences Conference in 2014. He has publications in the Journal of Operations Management and articles under review at the *Production and Operations Management*, *Journal of Service Management*, and *Journal of Service Research*. He has served as a reviewer for *Management Science*, *Production and Operations Management*, *Journal of Operations Management*, *Journal of Services Research*, *Service Science*, and the *Decision Sciences Journal of Innovative Education*.

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Introduction

The service sector represents the largest and the fastest-growing segment of the economies of the United States and other developed countries. This growth of services in the overall economy is also mirrored by the growth of services acquisition in the Department of Defense (DoD). For example, DoD obligations on contracts have more than doubled between fiscal years 2001 and 2008 to over $387 billion, with over $200 billion spent just for services in 2008 (Government Accountability Office [GAO], 2009a). However, during this time period, the acquisition workforce declined from about 500,000 to about 200,000 personnel by 2006 (Gansler, 2011, p. 237). The downsizing of the defense acquisition workforce has reduced the qualified contracting and acquisition workforce necessary to manage the increased service contract workload (GAO, 2002b, 2009b).

According to the GAO, the poor management of service contracts has undermined the government's ability to obtain a good value for the money spent and has contributed to the GAO's decision to designate management of services contracts as a high-risk area for the DoD (GAO, 2013). In fact, as stressed in a recent memorandum for acquisition professionals from the Under Secretary of Defense for Acquisition, Technology, and Logistics, improving the efficiency of acquisition of products and services is of utmost importance to the DoD (Under Secretary of Defense for Acquisition, Technology, and Logistics [USD(AT&L)], 2010a). More specifically, in a later memorandum, the USD(AT&L) has focused on "improving tradecraft in services acquisition" by strengthening and improving the services contracting process (USD[AT&L], 2010b, p. 5).

As the DoD's services acquisition continues to increase, the agency must give greater attention to proper acquisition planning, adequate requirements definition, sufficient price evaluation, and proper contractor oversight (GAO, 2002b). In some ways, the issues affecting services acquisition are similar to those affecting the acquisition of physical supplies and weapon systems. However, the unique characteristics of services and the increasing importance of services acquisition offer a significant opportunity for conducting research in the management of services acquisition in the Department of Defense.

Research Methodology

The objective of this research is to identify variables in the services contracting process that drive the success of services acquisition. Based on the analysis of our data, we generalize our research findings and provide recommendations for improving the Army's as well as DoD's services acquisition management. Our research approach includes analyzing contractor past performance data obtained from the DoD Past Performance Information Retrieval System Report Cards (PPIRS-RC) database. The PPIRS-RC database consists of contractor performance assessment reports contained in the DoD Contractor Performance Assessment Reporting System (CPARS). We access the PPIRS-RC database to collect contractor performance ratings on completed services contracts provided by CPARS to determine whether the contracts are successful or not successful. Statistical analysis is used to draw conclusions on whether certain contracting variables affect the success of the contract. The specific contract variables analyzed are type of service, contract dollar value, level of competition, and contract type. The following are the specific questions answered in this research:

1. Do the types of services being acquired affect the success of a service contract?
2. Do the contractual amounts affect the success of a service contract?
3. Does the level of competition used affect the success of a service contract?
4. Does the contract type affect the success of a services contract?

Literature Review

The academic research in the management of services acquisition is founded on several economic and management theories including agency theory (Eisenhardt, 1989), transaction cost economics (Williamson, 1979), contractual theory (Luo, 2002), service operations and supply management (Fitzsimmons & Fitzsimmons, 2006), and stakeholder theory (Cleland, 1986; El-Gohary, Osman, & El-Diraby, 2006; Freeman, 1984). For the purpose of this research, our focus is on agency theory and the principal–agent problem.

Agency Theory

Agency theory is reflected in a contract between the government and a contractor, forming a principal–agent relationship. The principal (government) contracts with the agent (contractor) to perform a specific level of effort, such as developing or manufacturing a product or providing a service. In this relationship, the

government's objectives include obtaining the product or service at the right quality, right quantity, right source, right time, and right price (Lee & Dobler, 1971). The principal, in this case the federal government, also has the additional objective of ensuring the product or service is procured in accordance with public policy and meets the needs of the public interest (Cohen & Eimicke, 2008; Snider & Rendon, 2008). Contractors, on the other hand, pursue the objectives of earning profit, ensuring company growth, maintaining or increasing market share, and improving cash flow, just to name a few. Because of the different and conflicting objectives between the principal and agent, each party is motivated and incentivized to behave in a certain manner. This behavior includes either withholding or sharing information. In principal–agent relationships that involve higher levels of uncertainty, which result in higher risk (such as developing an advanced technology weapon system), the information available to the government and contractor is typically asymmetrical. Thus, agency theory is concerned with the conflicting goals between the principal and agent in obtaining their respective objectives and is focused on mechanisms related to obtaining information (for example, about the marketplace, about the supply or service, or about the contractor); selecting the agent (to counter the problem of adverse selection); and monitoring the agent's performance (to counter the effects of moral hazard). Thus, decisions about how contracts are planned (for example, competitive or sole source), structured (fixed price or cost reimbursement, with or without incentives), awarded (based on lowest priced/technically acceptable offer, or the highest technically rated offer), and administered (centralized or decentralized, level and type of surveillance, and use of project teams) have their basis in agency theory and the principal–agent problem. These aspects of agency theory are directly applicable to services acquisition management. The next section discusses our past research in this area.

Services Supply Chain Management

We have addressed the need for research in this increasingly important area of services acquisition by undertaking six sponsored research projects over the past six years. The first two research projects (Apte, Ferrer, Lewis, & Rendon, 2006; Apte & Rendon, 2007) were exploratory in nature, aimed at understanding the types of services being acquired, the associated rates of growth in services acquisition, and the major challenges and opportunities present in the service supply chain.

The next two research projects were survey-based empirical studies aimed at developing a high-level understanding of how services acquisition is currently being managed at a wide range of Army, Navy, and Air Force installations (Apte, Apte, & Rendon, 2008, 2009). The analysis of survey data indicated that the current state of services acquisition management suffers from several deficiencies, including deficit billet and manning levels (which are further aggravated by insufficient training and

the inexperience of acquisition personnel) and the lack of strong project-team and life-cycle approaches. Our research (Apte, Apte, & Rendon, 2010) also analyzed and compared the results of the primary data collected in two previous empirical studies involving Army, Navy, and Air Force contracting organizations so as to develop a more thorough and comprehensive understanding of how services acquisition is being managed within individual military departments.

As a result of these research projects dealing with the service supply chain in the DoD, we developed a comprehensive, high-level understanding of services acquisition in the DoD, identified several specific deficiencies, and proposed a number of concrete recommendations for performance improvement.

Based on the foundation of the previously mentioned management theories, conclusions of the GAO and DoDIG reports (Seifert & Ermoshkin, 2010), and findings of our own sponsored research projects on the topic, we believe that the success of services acquisition contracts is significantly influenced by four broadly defined factors: (1) the type and quantity of services being outsourced and the associated amount of acquisition-related workload; (2) the characteristics of contracts being awarded; (3) the capacity available to carry out the contracting, project management, and surveillance work; and (4) various management practices such as use of project team or life-cycle approaches and so forth. A conceptual model indicating the interrelationship among these factors is shown in Figure 1.

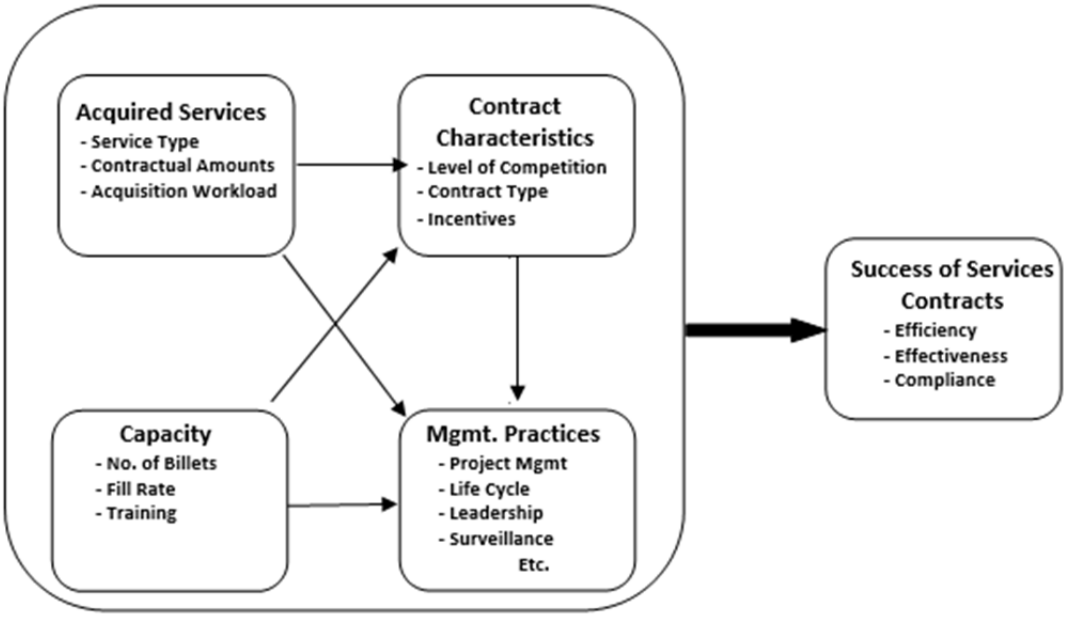


Figure 1. Drivers of Acquisition Practices and Success of Service Contracts

As shown in the conceptual diagram of Figure 1, the contract characteristics are affected by the type of service being acquired, while the management practices being used are influenced by the services being acquired, the contract characteristics, and, more important, the capacity available to perform the acquisition work. The success of services contracts, in turn, is affected by the previously mentioned four drivers. Underlying Figure 1 is the fundamental question motivating our in-depth research: What drives the success of services contracts? This fundamental question is, of course, critically important, and yet it is also not one that can be answered easily or quickly. We believe that, generally, in the case of questions related to complex systems, it is preferable to break down the overall system in smaller parts, gain an understanding of the functioning of each part, and then put all the pieces together to better understand the overall system and answer the fundamental question.

Based on our conceptual model, we sought to understand how the success of services contracts is being defined and measured by different stakeholders. On the aggregate level, our research indicated that, when defining a successful service contract, stakeholders considered outcomes (in the order of performance, cost, and schedule) slightly more important than processes. Stakeholders also ranked outcome-related factors as most important. Additionally, on the aggregate, our research indicated that, when measuring a successful service contract, stakeholders considered outcomes (in the order of cost, schedule, and performance) more important than processes. Stakeholders also ranked outcome-related factors as most important. On the stakeholder level, our research indicated that, when defining a successful service contract, PMs, CORs, and COs considered outcomes (in the order of performance, cost, and schedule) slightly more important than processes. PMs, CORs, and COs also ranked outcome-related factors as most important. On the stakeholder level, our research indicated that, when measuring a successful service contract, PMs, CORs, and COs considered outcomes (in the order of performance, schedule, and cost) more important than processes. PMs, CORs, and COs also ranked outcome-related factors as most important (Apte & Rendon, 2013).

Building on these research findings concerning how stakeholders define and measure the success of services contracts, we now explore the question of what variables in the services contracting process drive the success of services acquisition. As previously discussed, our research on defining and measuring services contracting success found that, on the aggregate, stakeholders considered outcomes slightly more important than processes for both defining and measuring success. Thus, we adopt contract outcomes, specifically the outcomes as reflected in the contractor performance assessment report, as a proxy for contract success. The next section provides a brief background on contractor performance information.

Contractor Performance Information

Contractor performance information is information regarding a contractor's performance under previously awarded contracts. Federal procurement policy requires that agencies collect contractor performance information for contracts over $100,000 and make that information available for use in future contract award decisions (Nash, Schooner, O'Brien-Debakey, & Edwards, 2007). The collection of contractor performance information occurs during the contract closeout phase using the DoD Contractor Performance Assessment Reporting System (CPARS; Rendon & Snider, 2008).

The CPARS assessment data reflect the contractor's performance in specific areas including quality, schedule, cost control, business relations, management of key personnel, and utilization of small business. The Quality rating assesses the contractor's qualitative performance and compares it to the requirements stated in the contract. The Schedule rating assesses the contractor's ability to meet schedules outlined in the contract such as milestones, task orders, delivery schedules, and administrative requirements. The Cost Control rating assesses the contractor's ability to forecast, manage, and control the costs associated with performing their services. The Business Relations rating assesses the contractor's ability to coordinate their business activities such as cooperative behavior, customer satisfaction, management, and attitude towards customers. The Management of Key Personnel rating assesses the contactor's ability to maintain qualified individuals in key positions as outlined in the contract. The Utilization of Small Business rating assesses the contractor's ability to integrate small businesses in the execution of the contract (Hart, Stover, & Wilhite, 2013).

Additionally, the CPARS assessment rates the contractor in these areas using the rating scales Exceptional, Very Good, Satisfactory, Marginal, and Unsatisfactory. It should be noted that the contractor is allowed to review the CPAR assessment and provide comments back to the government assessing official prior to the government's finalizing the CPAR report.

During the source selection phase of a government-negotiated procurement, contractor performance information is used in evaluating offerors and in making a contract award decision (Rendon & Snider, 2008). In this phase, the government agency accesses the contractor performance information through the DoD Past Performance Information Retrieval System Report Cards (PPIRS-RC) database. During source selection in the evaluation of offeror's proposals, the government agency uses the contractor past performance information to determine whether the offeror meets the required standards of responsibility as stated in the federal procurement policy, and, depending on the basis of award stipulated in the

solicitation, will use the contractor's past performance ratings to justify an award to a higher priced offeror.

The contractor performance information reported in CPARS and accessible through PPIRS provides outcome-based data that can be used to identify successful contracts. The successful contracts determined by using contractor performance information are used in our research methodology to identify the contract variables that lead to contract success. The research methodology for this project is discussed next.

Research Design

With the assistance of our MBA thesis students (Hart et al., 2013), we searched the PPIRS database to identify Army Mission Installation Contracting Command (MICC) services (non-systems) contracts for the period 1996–2013. This search yielded 14,395 contracts in total. The data were then refined to include only those contracts associated with the following product/service codes:

- R: Professional, Administrative, and Management Support Services
- J: Maintenance, Repair, and Rebuilding of Equipment Services
- S: Utilities and Housekeeping Services
- D: Automatic Data Processing and Telecommunications Services

This data refinement yielded 5,621 contracts. Our database was further refined by focusing on five Army MICC contracting organizations:

- MICC Region Fort Eustis
- MICC Region Fort Knox
- MICC Region Fort Hood
- MICC Region Fort Bragg
- MICC Region Fort Sam Houston

These organizations were selected because they are MICC field directorate offices (FDOs) of this specific Army contracting command. This data refinement resulted in 715 service contracts that were used in conducting our analysis, as seen in Table 1.

Table 1. Database Breakdown
(Hart et al., 2013)

	Total Contracts
Total Army MICC Non-System Contracts	**14,395**
Less: Non–R, J, S, D Service Contracts	**8,774**
Total R, J, S, D Service Contracts	**5,621**
Less: R, J, S, D Service Contracts at other MICC	**4,906**
R, J, S, D Service Contracts at MICC FDO Eustis, Knox, Hood, Bragg, Sam Houston	**715**
Fort Eustis	238
Fort Knox	119
Fort Hood	114
Fort Bragg	55
Fort Sam Houston	189

For each contract, data were collected on specific contract variables (type of service, contract dollar value, level of competition, contract type) and specific contractor assessment ratings (quality of product/service, schedule, cost control, business relations, management of key personnel, and utilization of small business). It should be noted that the data collected from the PPIRS database were sanitized by removing identifiable data such as contract number, contractor name, DUNS number, and place of performance. In addition to the contractor performance information accessed from the PPIRS-RC database, we also collected MICC region organization demographic data (annual workload in dollars, annual workload in actions, number of 1102 billets authorized, and percentage of 1102 billets filled (Hart et al., 2013), These data were also analyzed to determine whether these organizational demographics were related to contract success.

Determining a contract to be successful or unsuccessful was made based on whether the contractor received a marginal or unsatisfactory rating in any of the CPAR assessment areas (quality of product/service, schedule, cost control, business relations, management of key personnel, or utilization of small business). The contractor's receiving a marginal or unsatisfactory rating in any one of these assessment areas results in the determination of the contract as unsuccessful.

Based on the analysis of the data pertaining to contract variables and contractor assessment ratings, we answered our four primary research questions:

1. Do the types of services being acquired affect the success of a service contract?
2. Do the contractual amounts affect the success of a service contract?
3. Does the level of competition used affect the success of a service contract?
4. Does the contract type affect the success of a services contract?

Figure 2 graphically illustrates our research methodology. The column on the right contains the six CPARS assessment areas. These areas are used to determine whether each contract is successful or unsuccessful based on the CPAR ratings (marginal or unsatisfactory). The successful contracts are analyzed using the four contract variables shown on the left column. The purpose is to determine whether there is a relationship between contract variables and contract success.

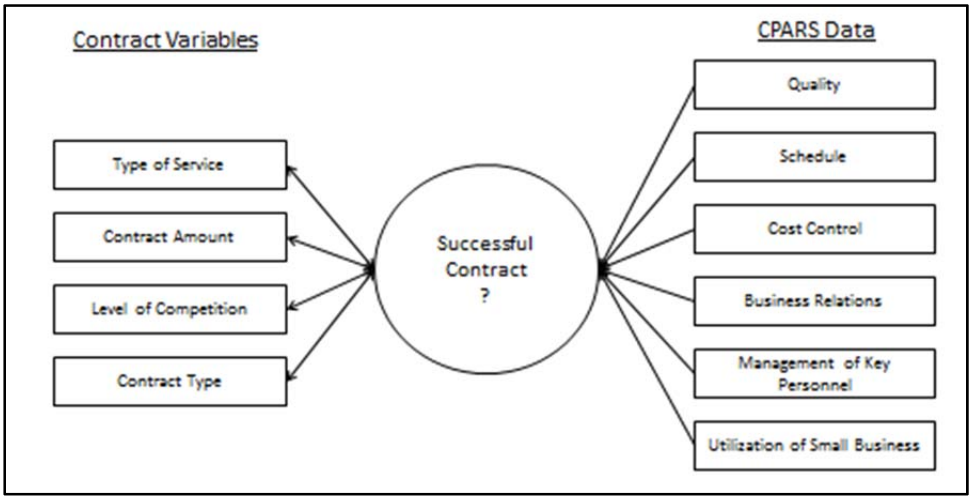


Figure 2. Research Methodology
(Hart et al., 2013)

Findings and Analysis

In this section, we present an analysis of our findings. As mentioned previously, the primary purpose of this research is to determine if there is a relationship between contract variables (type of service, contract dollar value, level of competition, contract type) and contract success (based on contractor assessment rating of quality, schedule, cost control, business relations, management of key personnel, and utilization of small business). With the assistance of our MBA thesis students (Hart et al., 2013), we analyzed the data and provide our findings at the aggregate level, as well as the contract variable level.

Aggregate Findings

The database consisted of 715 contracts accessed from the PPIRS database. Of these contracts, 22 were determined to be unsuccessful based on the CPAR assessment area ratings, as described in the previous section. This resulted in a total contract failure rate of 3.08%. These results are seen clearly in Table 2.

Table 2. Total Contract Information
(Hart et al., 2013)

	Failures	Success	Total	Failure Rate
Contracts	22	693	715	3.08%

Additionally, each assessment area was given a score associated with its rating (Exceptional, 5; Very Good, 4; Satisfactory, 3; Marginal, 2; Unsatisfactory, 1). These assessment area ratings were then averaged to examine what assessment areas were rated higher throughout the population (see Table 3). As reflected in Table 3, business relations had the highest average rate of failure among the other assessment areas. The total contract failures for each CPAR assessment area can be seen in Figure 3.

Table 3. Average Success and Failure Rates of PPIRS Areas of Contract Evaluation
(Hart et al., 2013)

	Successes Average Ratings	Failures Average Ratings
Quality	4.19	2.5
Schedule	4.19	2.5
Cost Control	4.1	2.31
Business Relations	4.17	3
Management of Key Personnel	4.18	2.68
Utilization of Small Business	4.07	2.5

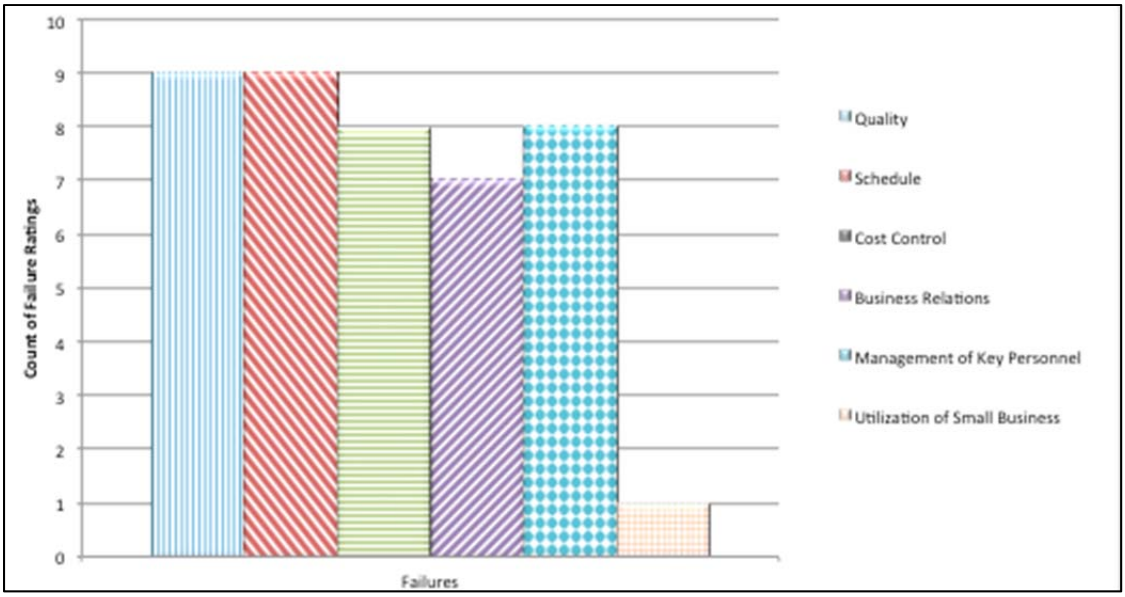


Figure 3. Stated Reason of Failure Label for All Contracts
(Hart et al., 2013)

The next section discusses our research findings for each contract variable.

Type of Service

Finding 1: The S type services (Utilities and Housekeeping) had the highest failure rate of all the product service codes analyzed.

In answering the first research question, "Do the types of services being acquired affect the success of a service contract?", we analyzed the failure rates of each service type. The database contained 331 R type (Professional, Administrative, and Management Support) services, 58 J type (Maintenance, Repair, and Rebuilding of Equipment) services, 292 S type (Utilities and Housekeeping) services and 34 D type (Automatic Data Processing and Telecommunications) services as reflected in Table 4. The failure rates are reflected in Figure 4, and the failure reasons are reflected in Figure 5.

The S type services had 11 contract failures resulting in a 3.77% failure rate. Two reasons tied for the most common reasons for S type service failures. These reasons were six business relation failures and six failures due to management of key personnel. R type services had nine labeled failing contracts out of 331, giving R type services a failure rate of 2.72% which was the second lowest. The most common reason for the failure was quality. J type services consisted of 58 contracts with two labeled failures. This gave the J type contracts a failure rate of 3.45%. Scheduling was listed as a reason for both labeled failures of the J type services. There were only 34 of D service code contract types with zero failures.

Table 4. Type of Service Acquired Total Successes and Failures
(Hart et al., 2013)

Type of Service Acquired Categories	Total Successes	Total Failures	Total Contracts	Failure Rates
D	34	0	34	0.00%
J	56	2	58	3.45%
R	322	9	331	2.72%
S	281	11	292	3.77%
Total	**693**	**22**	**715**	**3.08%**

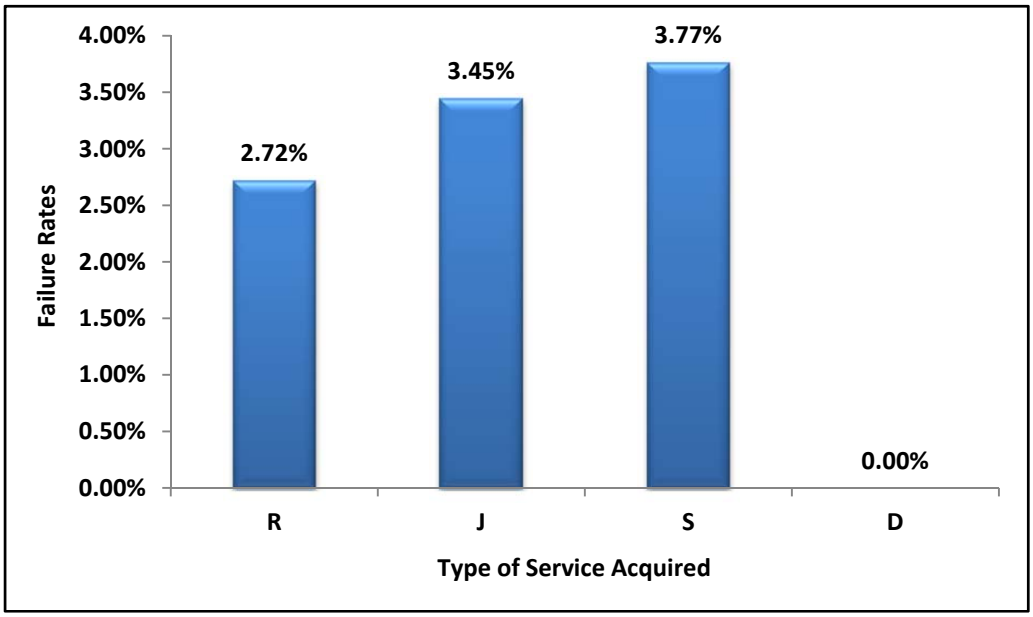


Figure 4. Failure Rates of the Different Product Service Code Contracts
(Hart et al., 2013)

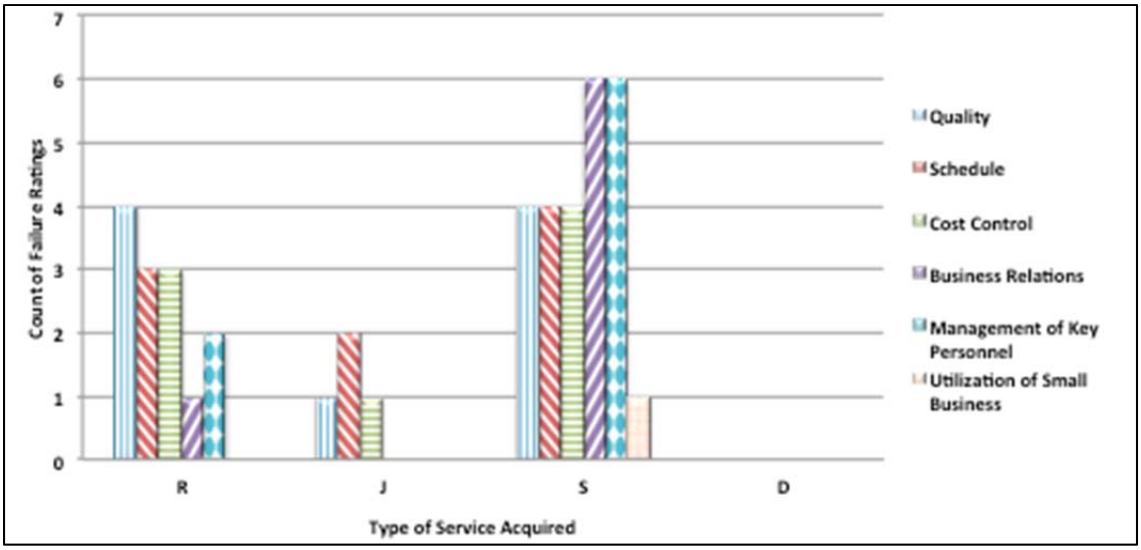


Figure 5. Reasons for Contract Failure
(Hart et al., 2013)

Although it was found that the type of service was not statistically significant in terms of effecting contract success, it was observed that utilities and housekeeping service contracts failed six times for business relations and six times for management of key personnel out of the 11 reported failures. Mitigating this contract risk should focus on the source selection phase, specifically the proposal evaluation activity. During this phase the contracting agency can emphasize its assessment of the offeror's ability to coordinate its business activities such as its attitude towards customers, customer satisfaction, and cooperation. Additionally, during source selection, the contracting agency should increase its emphasis on evaluating the offeror's management proposal, and assessing the offeror's ability to maintain qualified individuals in key positions as required in the solicitation.

Contract Dollar Value

Finding 2: Contracts with a dollar value from $50 million to $1 billion had the highest failure rate of all the contract categories.

In answering the second research question, "Do the contractual amounts affect the success of a service contract?", we grouped the contracts into the following categories: $0 to $1 million, greater than $1 million to $10 million, greater than $10 million to $50 million, greater than $50 million to $1 billion, and greater than $1 billion (see Table 5). The failure rates are reflected in Figure 6, and the failure reasons are reflected in Figure 7.

The $50 million to $1 billion category consisted of 92 contracts with eight labeled failures, giving it a failure rate of 8.7%. This group's most common reason

for failing was cost control, which was listed for six failed contracts. This failure rate is much higher than the total contract average failure rate of 3.08%.

In the first group that consisted of contracts that were worth $0 to $1 million, there were a total of 35 contracts. In this first group, there was only one labeled a failure. This gave this group a 2.86% failure rate. This contract was labeled a failure because of quality.

The group consisting of contracts greater than $1 to $10 million was the largest of all the grouped dollar amounts. It consisted of 466 contracts, and of those 10 were labeled failures. That gave this group a 2.15% failure rate. While this group had the most failures numerically, it still was under the average failure rate because of the number of contracts in this group. The most common reason for this group to fail was for quality, which was cited seven times.

The contracts in the greater than $10 to $50 million group consisted of 118 contracts. There were three labeled failures in this group. This group had a 2.54% failure rate. This group was also under the average total contract failure rate of 3.08%. This contract group most commonly failed for scheduling issues and management of key personnel. It failed for scheduling twice and management of key personnel twice. This means that one of the contracts in this group had both issues listed as reasons for failure.

The group consisting of contracts worth greater than $1 billion was the smallest group in our contractual amount grouping. It only consisted of four contracts and did not contain any labeled failures.

Table 5. Contract Amount Total Successes and Failures
(Hart et al., 2013)

Contract Dollar Amount Categories	Total Successes	Total Failures	Total Contracts	Failure Rates
$0–$1M	34	1	35	2.86%
>$1M–$10M	456	10	466	2.15%
>$10M–$50M	115	3	118	2.54%
>$50M–$1B	84	8	92	8.70%
>$1B	4	0	4	0.00%
Total	**693**	**22**	**715**	**3.08%**

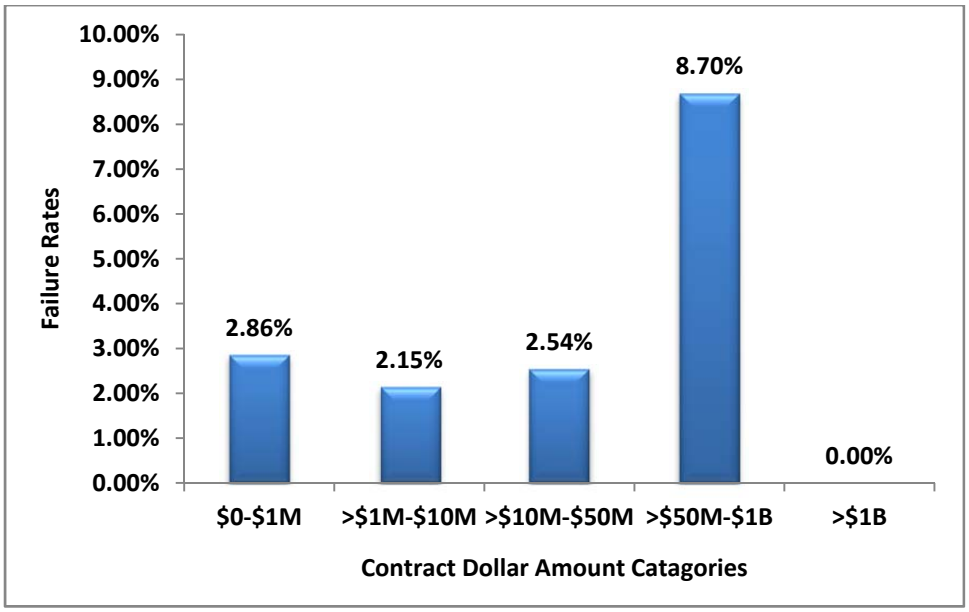


Figure 6. Failure Rate by Grouped Dollar Value
(Hart et al., 2013)

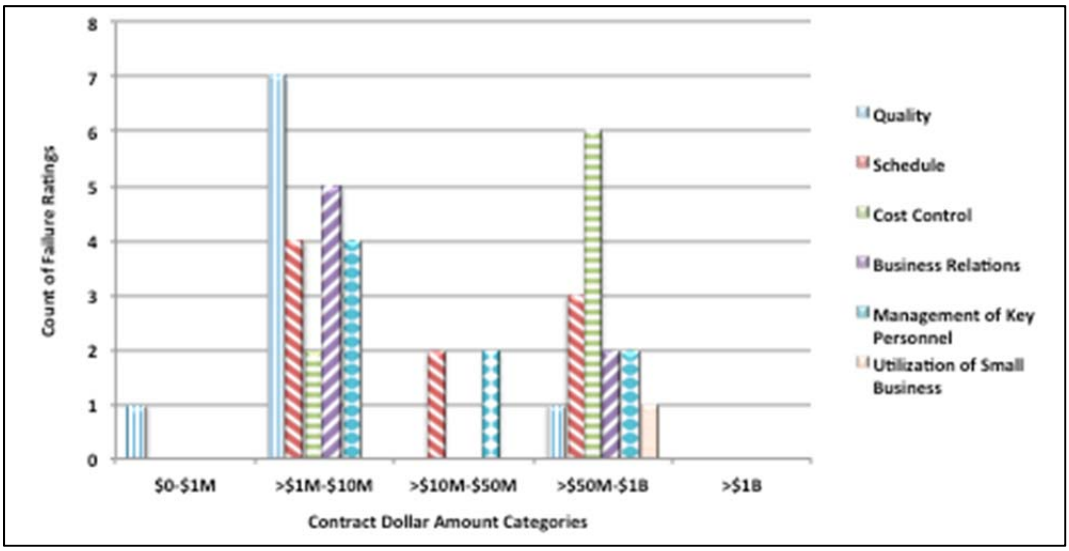


Figure 7. Reasons for Grouped Dollar Value Failure
(Hart et al., 2013)

Our analysis found that the contract dollar value does have a significant impact on service contracting success. Contracts with dollar values in the $50 million–$1 billion range had the highest failure rate at 8.7%. The most common reason for this failure was cost control. Assuming that the awarded contract was proper (based on an accurate government cost estimate), mitigating this contract risk should focus on the source selection phase. During the evaluation of the offeror's cost proposal, the source selection team should accurately assess the

offeror's ability to forecast, manage, and control the cost associated with conducting the services. Additionally, the source selection team must ensure that all source selection evaluators are properly trained on how to accurately evaluate the offeror's cost proposal to ensure the business fully understands the contract requirements.

Our analysis also found that the group of contracts with values ranging from $1 million–$10 million had a total of 10 failures, with seven failures listed for quality reasons. Although not statistically significant, this reason for failure deserves further discussion. Mitigating the contract quality risk should focus on the technical proposal evaluation during the source selection phase. The source selection team should be thoroughly knowledgeable about the technical and quality requirements of the solicitation. Only with a competent source selection team can a sufficient evaluation of the offeror's technical and quality approach can be conducted. A thorough evaluation of the offer's technical proposal will reveal whether the offeror has the technical capability to meet the contract quality requirements.

Level of Competition

Finding 3: Contracts awarded competitively had the highest failure rate when compared to the other contracts.

In answering the third research question, "Does the level of competition affect the success of a service contract?", we grouped the contracts into three categories: competitive, non-competitive, and other. The researchers looked at these different categories separately and examined the failure rate of each group as reflected in Table 6. The failure rates are reflected in Figure 8, and the failure reasons are reflected in Figure 9.

Of the 540 competitive contracts, 17 were labeled as failures, which yields a failure rate of 3.15%. The reasons that most often resulted in a contract failure were in the areas of schedule and cost control, which were each referenced seven times. The next highest referenced source of failure was management of key personnel, which was referenced six times.

Non-competitive contracts had the next highest failure rate at 2.91%. There were 172 non-competitive contracts in the database, of which five were labeled failures. Quality was referenced four times while schedule, management of key personnel, and business relations were each referenced twice.

Contracts competed as Other had three contracts in the database with zero labeled failures.

Table 6. Level of Competition Total Successes and Failures
(Hart et al., 2013)

Level of Competition Categories	Total Successes	Total Failures	Total Contracts	Failure Rates
Basis (Competitive)	523	17	540	3.15%
Basis (Non-Competitive)	167	5	172	2.91%
Basis (Other)	3	0	3	0.00%
Total	**693**	**22**	**715**	**3.08%**

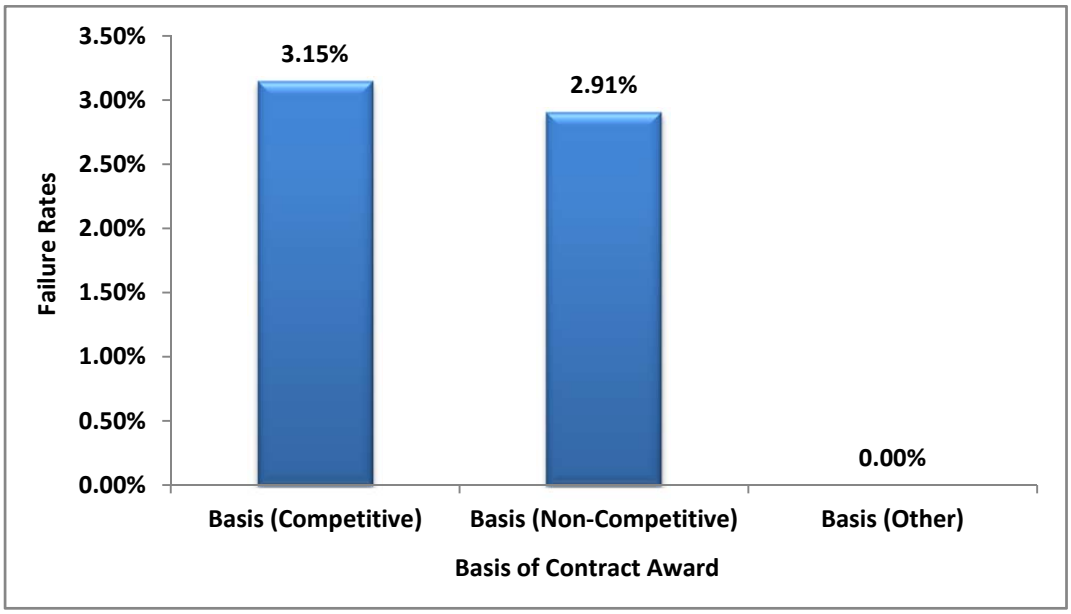


Figure 8. Failure Rates Among Level of Competition
(Hart et al., 2013)

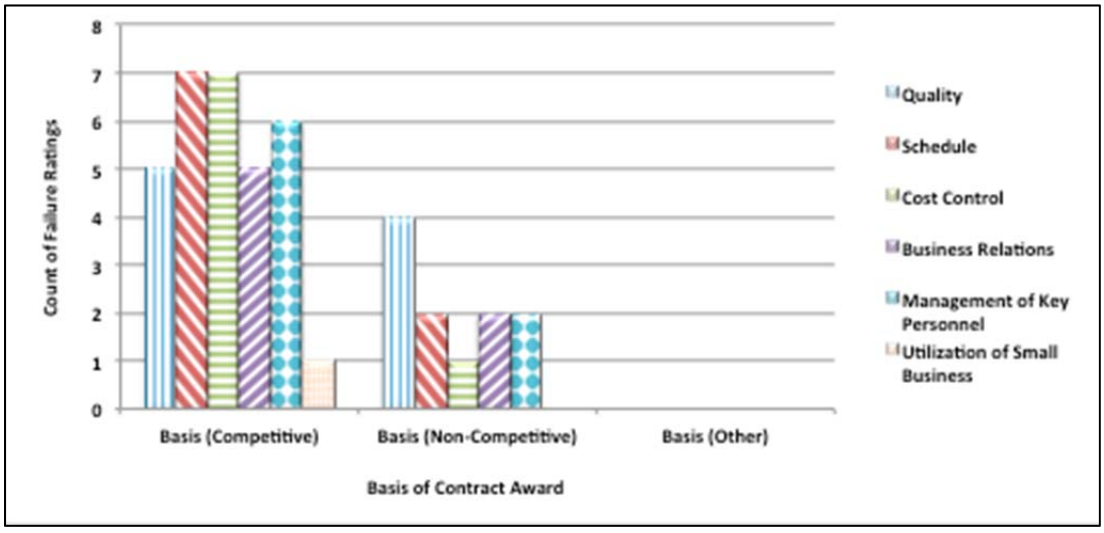


Figure 9. Levels of Competition Stated Reasons for Failure
(Hart et al., 2013)

Our research found that competitively awarded contracts had the highest of the category's failure rates at 3.15%. These contracts failed seven times for scheduling reasons and seven times for cost control. The implications of these findings point to the proposal evaluation aspect of the source selection process. The source selection evaluators must fully understand the cost, schedule, and performance requirements of the solicitation in order to properly evaluate the offeror's proposal. The offeror's proposal will reflect its understanding of the contract requirements as well as its capability for meeting those requirements. If the government does not do an adequate job in evaluating the offeror's proposal, it increases the risk for contractor schedule delays and cost overruns.

Contract Type

Finding 4: Contracts structured as a combination contract had the highest failure rate when compared to the other five types of available contracts.

In answering the fourth research question, "Does the contract type affect the success of a service contract?", we grouped the contracts into six categories: Cost Plus Award Fee (CPAF), Combination, Cost Plus Fixed Fee (CPFF), Cost Plus Incentive Fee (CPIF), Firm Fixed-Price (FFP), and Other. The Other category includes all the contracts that did not fit into the previous five categories, such as Labor Hours, and Time and Materials. Table 7 presents the number of failures for each contract category. The failure rates are reflected in Figure 10, and the failure reasons are reflected in Figure 11.

There were four combination contracts examined in the database. Of these four contracts, two were labeled failures, which yields a failure rate of 50.0%. Schedule and cost were both referenced twice in the failed contracts, while quality and management of key personnel were each referenced once.

Cost plus fixed fee contracts had the next highest failure rate at 5.56%. There were 36 CPFF contracts in the database, of which two were labeled failures. Cost control was referenced twice, and schedule was referenced once in the failed contracts.

Contracts competed as cost plus award fee had 58 contracts in the database, with three of them labeled as failures. This yielded a failure rate of 5.17%. Two of these failed contracts referenced cost control and business relations, while one referenced the management of key personnel.

Firm fixed-price contracts had 524 contracts in the database, with 14 of them labeled as failures. This yielded a failure rate of 2.68%. Seven of these failed contracts referenced quality, while six referenced the management of key personnel.

Other contract types had 89 contracts in the database with one labeled as a failure due to quality and schedule, which yielded a failure rate of 1.12%. There were four cost plus incentive fee contracts, which had zero labeled failures.

Table 7. Contract Type Total Successes and Failures
(Hart et al., 2013)

Contract Type Categories	Total Successes	Total Failures	Total Contracts	Failure Rates
CPAF	55	3	58	5.17%
Combination	2	2	4	50.00%
CPFF	34	2	36	5.56%
CPIF	4	0	4	0.00%
FFP	510	14	524	2.67%
Other	88	1	89	1.12%
Total	**693**	**22**	**715**	**3.08%**

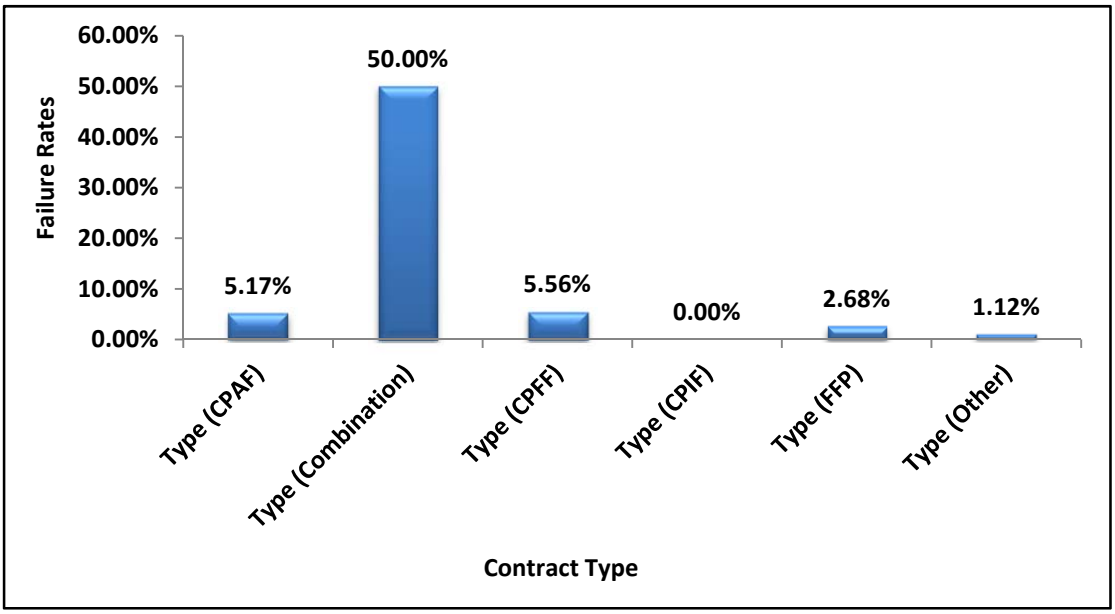


Figure 10. Contract Type Failure Rate
(Hart et al., 2013)

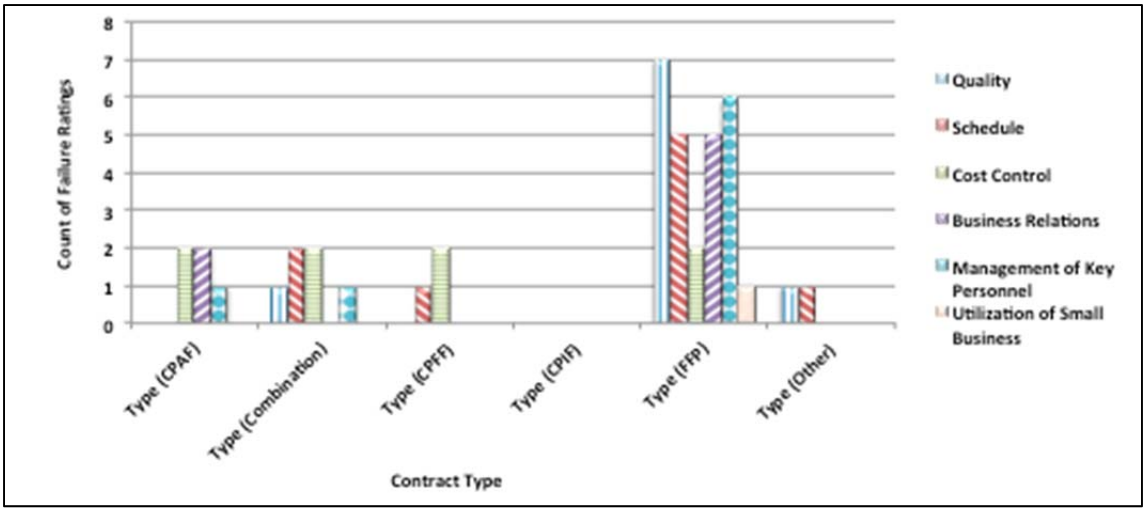


Figure 11. Contract Type Stated Reasons for Failure
(Hart et al., 2013)

The type of contract used in these services acquisition was statistically significant in relation to contract success. Of three categories of contract types (combination, CPAF, and CPIF), the combination type showed a failure rate of 50% (two failures out of four), CPAF showed a failure rate of 5.17%, and CPFF a failure rate of 5.56%. These last two categories are double the failure rate of the FFP category which was 2.67%. The leading and recurring cause of contract failure for these contracts was cost control. The implication of this finding focuses us on the procurement planning phase of services acquisition. The government's effort during procurement planning, specifically the requirements analysis and the market research activities, should ensure that the requirement and the market are sufficiently analyzed in order to select the appropriate contract type. The more defined the requirement, the more appropriate it is to use a fixed-price contract. In the event that a cost-type contract is selected, the government should ensure that an accurate cost estimate is developed to be used in cost negotiations. Additionally, during the source selection phase, specifically the cost proposal evaluation activity, the government should ensure that the offeror's cost proposal accurately reflects a thorough understanding of the service effort and the related costs. If the government does not do an adequate job in evaluating the offeror's proposal, it increases the risk for contractor schedule delays and cost overruns. If the government does not conduct a sufficient evaluation of the offeror's cost proposal, it may award the contract to an offeror who does not have an adequate understanding of the service requirement and thus leads to greater possibility of cost overruns. In addition to the contract variables previously discussed, we also analyzed other variables to determine whether they had any effect on contract success. The other variables include MICC annual workload (by dollar value), MICC annual workload (by number of actions), number of 1102 billets, and percentage of 1102 billets filled. We also

analyzed the data in terms of workload (in dollars) per filled billet. The next section discusses the findings related to these variables.

Significance Testing

We further analyzed our data to determine whether any of the variables had a significant relationship with contract success by specifically looking at the contract failure rates. We used the chi-square test (Fisher's exact test) to test whether the actual failure rates are significantly different than from what would be expected if the total contract failure rate was applied to each variable. The null hypothesis for this test was that the category failure rates within the variables are not significantly different from the total contract failure rate (3.08%). We reject the null hypothesis if the *p*-value for the variable is less than .05. The results of the chi-square test are reflected in Table 8.

Table 8. Chi-Square and Fisher's Exact *p*-Value Test Results
(Hart et al., 2013)

Contract Variables	*p*-value	Significant?
Type of Service (RJSD)	0.761	No
Contractual Amounts	0.036	Yes
Level of Competition	1.00	No
Contract Type	0.009	Yes

The chi-square test resulted in only two variables being significantly different when the average total contract failure rate is applied to the variable (3.08%). These variables were contract dollar value ($p = .036$) and contract type ($p = .009$). In the contract dollar value variable, the category of $50 million to $1 billion had an expected failure rate of 1 but had an actual failure rate of 8. In the contract type variable, the category of Combination Type contracts was expected to have a .1 failure but actually had 2 failures. Additionally, FFP Type contracts were expected to have 16 failures but actually had 14 failures. Finally, Other Type contracts were expected to have 3 failures but only had 1 failure.

MICC Workload in Dollars

Finding 5: Regional MICC offices that had spent between $0 and $500 million in annual workload had the highest failure rate.

We grouped the contracts into three categories based on the MICC regional office's annual workload (dollars obligated). The categories consisted of total dollars obligated between $0 and $500 million, greater than $500 million to $1 billion, and greater than $1 billion. This is reflected in Table 9. The failure rates are reflected in Figure 12, and the failure reasons are reflected in Figure 13.

The first category, MICC regions that obligated between $0 and $500 million, consisted of 344 contracts and had a failure rate of 4.36%. The primary reason stated for failure was schedule for this category.

The second category, MICC regions that obligated greater than $500 million to $1 billion, consisted of 256 contracts with a failure rate of 2.34%. Management of key personnel was stated as the reason for failures.

The third category, obligations greater than $1 billion, contained 115 contracts with only one of them being labeled a failure giving it a .87% failure rate. The labeled failure listed cost control and business relations as the reason for failure.

Table 9. Annual Workload in Dollars Total Success and Failures
(Hart et al., 2013)

Contract Dollar Amount Categories	Total Successes	Total Failures	Total Contracts	Failure Rates
$0–$500M	329	15	344	4.36%
>$500M–$1B	250	6	256	2.34%
>$1B	114	1	115	0.87%
Total	**693**	**22**	**715**	**3.08%**

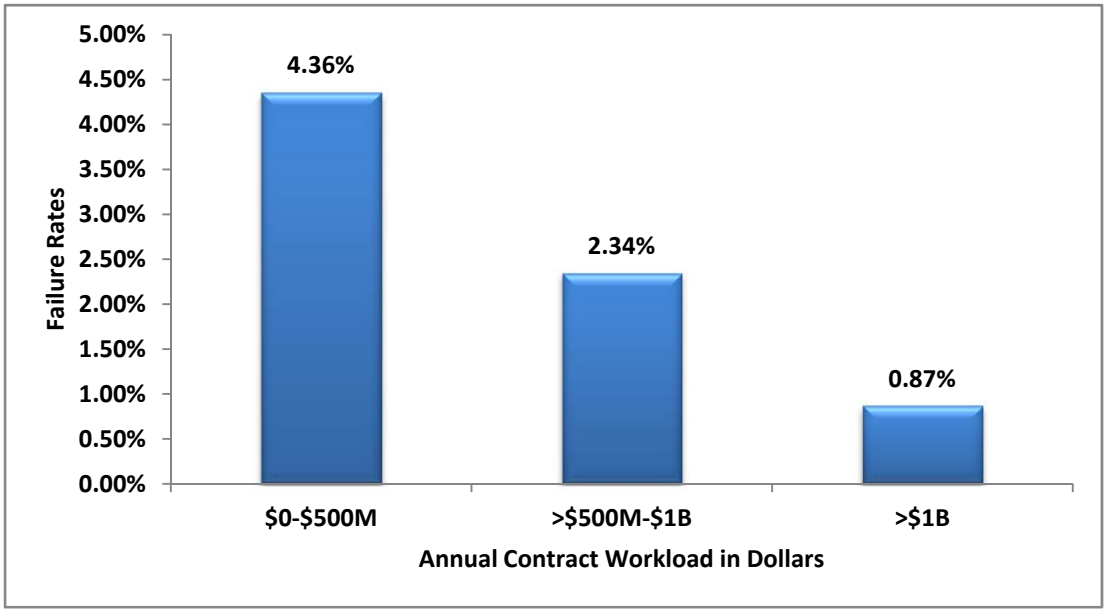


Figure 12. Annual Workload in Dollars Failure Rates
(Hart et al., 2013)

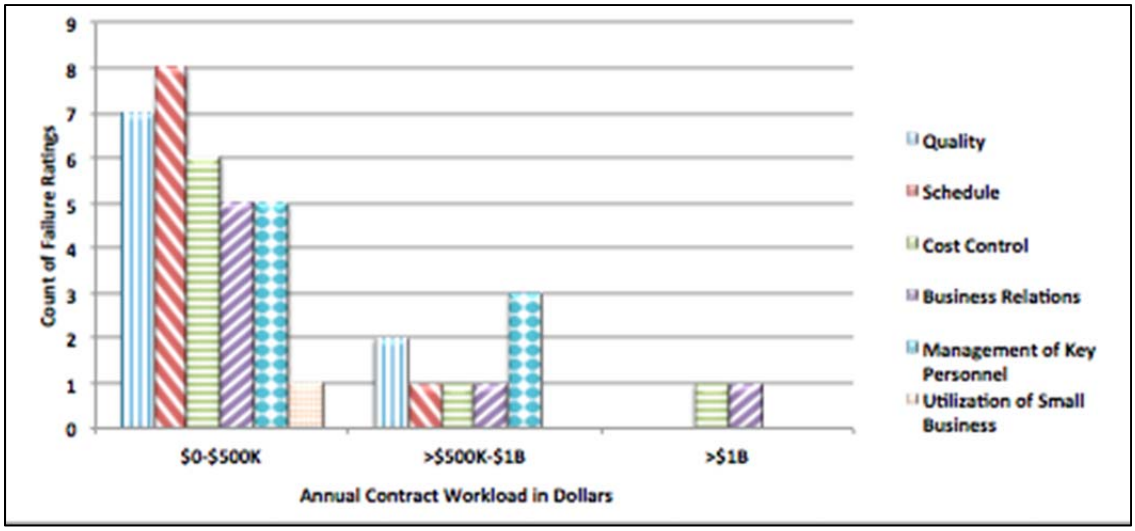


Figure 13. Annual Workload in Dollars Stated Reason for Failures Among the Ratings
(Hart et al., 2013)

MICC Workload in Actions

Finding 6: MICCs that completed 3,501 to 7,000 contract actions annually had the highest failure rate when compared to MICCs that completed 3,500 or fewer contract actions.

We grouped the contracts into two categories based on the MICC regional office's annual workload (actions completed). The first category ranged from 0 to 3,500 contract actions. The second category ranged from 3,501 to 7,000 contract actions. This is reflected in Table 10. The failure rates are reflected in Figure 14, and the failure reasons are reflected in Figure 15.

The 3,501 to 7,000 contract actions category consisted of 277 contracts. Of these 277 contracts, nine were labeled as failures, which yielded a failure rate of 3.25%. Quality and the management of key personnel were each referenced five times in the failed contracts.

The 0 to 3,500 contract actions category consisted of 413 contracts of which 12 were labeled as failures, resulting in a failure rate at 2.91%. Schedule and cost control were each referenced five times while quality was referenced four times in the failed contracts. There were no data available for the 25 contracts of which one was labeled a failure.

Table 10. Number of Contract Actions Versus Total Success and Failures
(Hart et al., 2013)

Number of Actions Categories	Total Successes	Total Failures	Total Contracts	Failure Rates
0–3,500	401	12	413	2.91%
3,501–7,000	268	9	277	3.25%
Data not available	24	1	25	4.00%
Total	**693**	**22**	**715**	**3.08%**

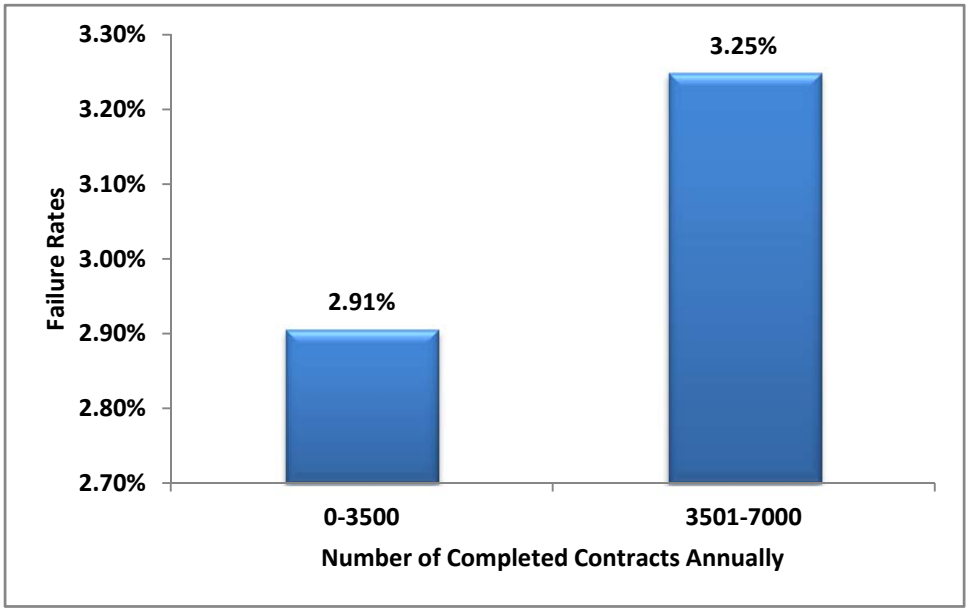


Figure 14. Failure Rates by Number of Completed Contracts Annually
(Hart et al., 2013)

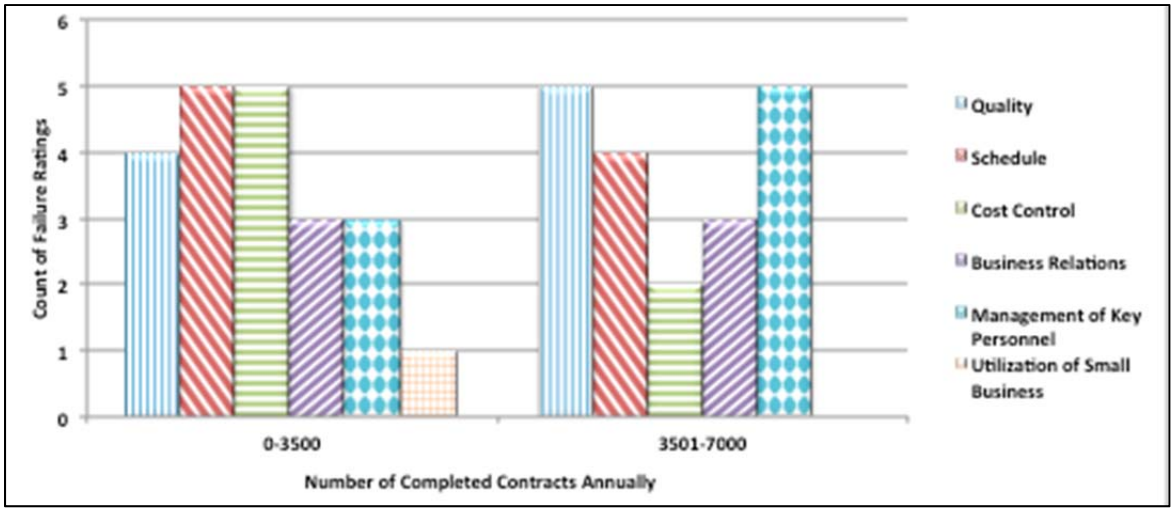


Figure 15. Number of Completed Contracts Annually Stated Reasons for Failure
(Hart et al., 2013)

1102 Billets (Authorized)

Finding 7: The category with 0 to 50 1102 billets had the highest failure rate.

We grouped the contracts into three categories based on the number of 1102 billets authorized for each MICC regional office. The first category consisted of MICC regional offices that had 0 to 50 1102 billets, the second category consisted of MICC regional offices that had over 50 authorized 1102 billets. (There were 25 contracts that did not have any data available). This is reflected in Table 11. The failure rates are reflected in Figure 16, and the failure reasons are reflected in Figure 17.

MICC regional offices that had 0 to 50 authorized 1102 billets consisted of 147 contracts with eight failures, giving these MICC offices a failure rate of 5.44%. The common reason for these failures was quality. This reason was listed for five of the eight labeled failed contracts.

MICC regional offices that had over 50 authorized 1102 billets consisted of 543 contracts with 13 failures, giving this group a 2.39% failure rate. The most common reason for failure listed for this group was schedule. This reason was listed seven times out of the 13 labeled failed contracts.

The final category did not have data on authorized billets. This group contained 25 total contracts with one failure, giving this category a 4% failure rate.

Table 11. Authorized 1102 Billets Total Success and Failures
(Hart et al., 2013)

Authorized 1102 Billets Categories	Total Successes	Total Failures	Total Contracts	Failure Rates
0–50	139	8	147	5.44%
51–105	530	13	543	2.39%
Data not available	24	1	25	4.00%
Total	**693**	**22**	**715**	**3.08%**

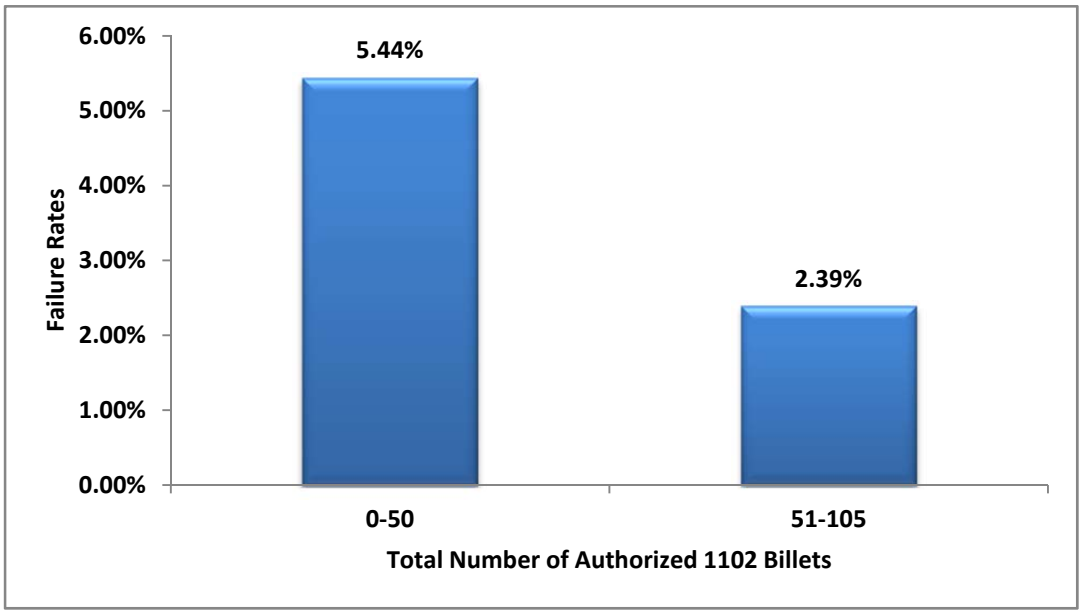


Figure 16. Failure Rates of MICCs by 1102 Billet Authorizations
(Hart et al., 2013)

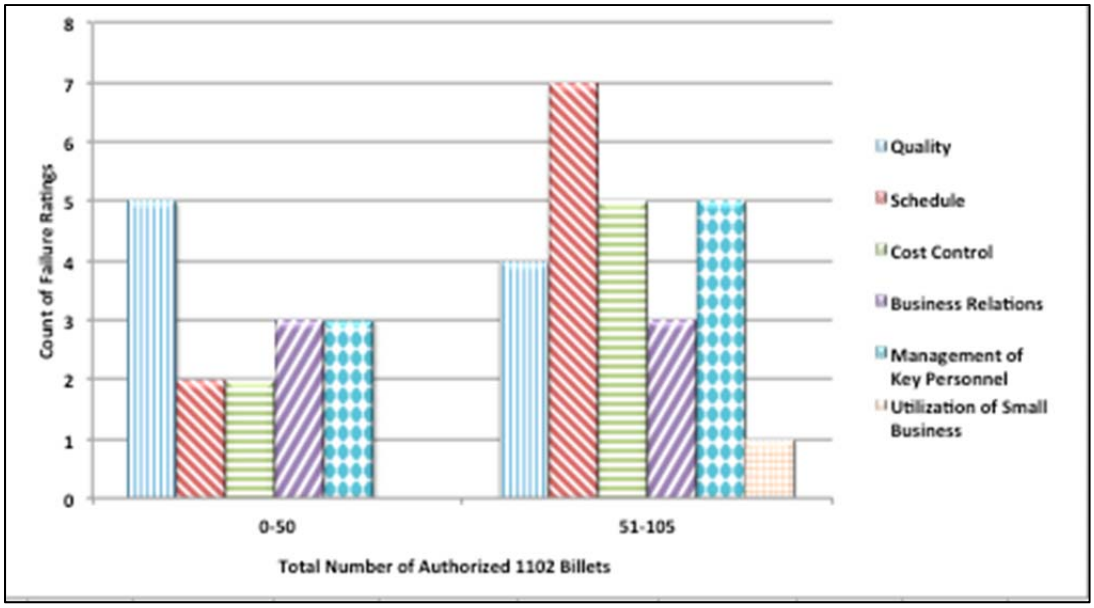


Figure 17. Reasons for Failures by Billet Authorization
(Hart et al., 2013)

1102 Billets (Percentage Filled)

Finding 8: As the percentage of 1102 filled billets increased, the contract failure rate decreased.

We grouped the contracts into six categories based on the percentage of 1102 billets filled for each MICC regional office. The categories consisted of MICC regional offices that had billets 50–60% filled, 61–70% filled, 71–80% filled, 81–90% filled, and 91–100% filled. (There were also contract data that did not contain adequate billet information.) This finding is reflected in Table 12. The failure rates are reflected in Figure 18 and the failure reasons are reflected in Figure 19.

The MICC region group of 1102 billets that were 61–70% filled had 81 contracts, with a 4.94% failure rate. The most common reasons listed for this group to fail were schedule and cost control.

For the MICC region group of 1102 billets that were 50–60% filled had 22 contracts with one labeled failure, which gave this group a 4.55% failure rate. This rate is higher than the total contract average of 3.08%. The reason for the failure in this group was quality, scheduling, and management of key personnel.

The next group of 1102 billets that were 71–80% filled consisted of 122 total contracts with five contracts labeled as failures, giving this group a 4.1% failure rate. This group was higher than the total contract failure rate of 3.08%. The most frequent reasons listed for the contract failures were schedule and cost control.

The group that contained billets filled 81–89% had 233 contracts with five labeled as failures, giving this group a 2.15% failure rate. The most common reasons for failure of these contracts were quality, schedule, and business relations.

The data for the final group that had billets 90–100% filled consisted of 99 total contracts. It contained one labeled failure, giving this group a failure rate of 1.01%. The reason for the failure in this group was management of key personnel.

Table 12. Percentage of 1102 Billets Filled Total Success and Failures
(Hart et al., 2013)

Percentage of 1102 Billet Filled Categories	Total Successes	Total Failures	Total Contracts	Failure Rates
50–60%	21	1	22	4.55%
61–70%	77	4	81	4.94%
71–80%	117	5	122	4.10%
81–89%	228	5	233	2.15%
90–100%	98	1	99	1.01%
Data not available	152	6	158	0.00%
Total	**693**	**22**	**715**	**3.08%**

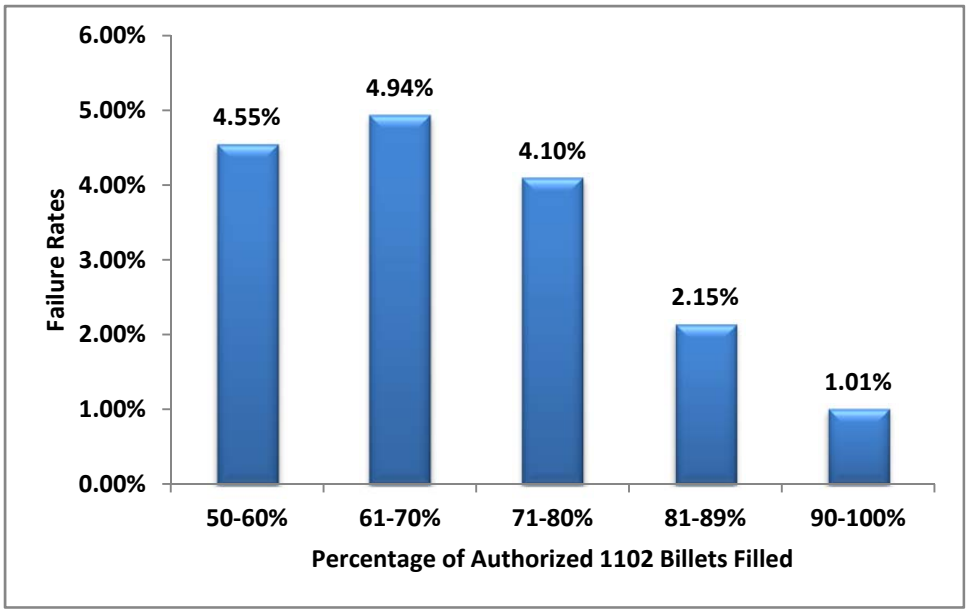


Figure 18. Failure Rate for Different 1102 Billet Vacancy Groups
(Hart et al., 2013)

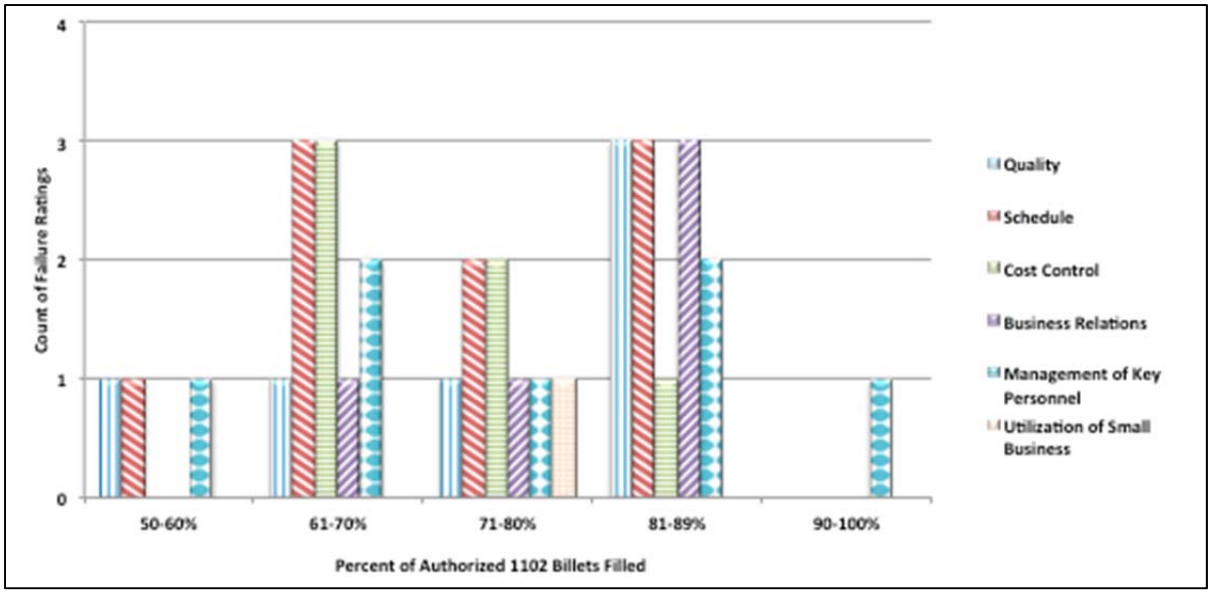


Figure 19. Reasons for Failures of Different 1102 Vacancy Groups
(Hart et al., 2013)

Although it was found that the percentage of 1102 billets filled was not statistically significant in terms of effecting contract success, it was observed that as the percentage of 1102 filled billets increased, the contract failure rate decreased. Thus, as the MICCs contracting workforce increased, the contract success rate increased. This finding supports the previous reports on the importance of having trained 1102 personnel (GAO, 2002b, 2009a; Gansler, 2011). Having a sufficient contracting workforce enables the government to perform due diligence not only in the source selection phase of the contract, but also in the contract administration phase as well.

Workload Per Filled Billet

Finding 9: As workload dollars per filled billet increases, contractor performance ratings also increase, and thus contract failure ratings decrease.

In addition to analyzing the data in terms of workload (both dollars and actions) as well as billets (both authorized and percentage filled), we also analyzed the data by looking at workload (in dollars) per filled billet as it correlated with associated failure rates and average CPARS ratings across seven dimensions for which contracts are rated. Our purpose here was to determine whether workload (in dollars) per filled billet, as a measure of contracting work being performed by an individual, is related to contract failure rate, as reflected in performance outcome. Table 13 reflects the workload (in dollars) per filled billet, for each MICC, for each year. Also reflected in the table is the average rating for each performance evaluation area, as well as the contract failure rate.

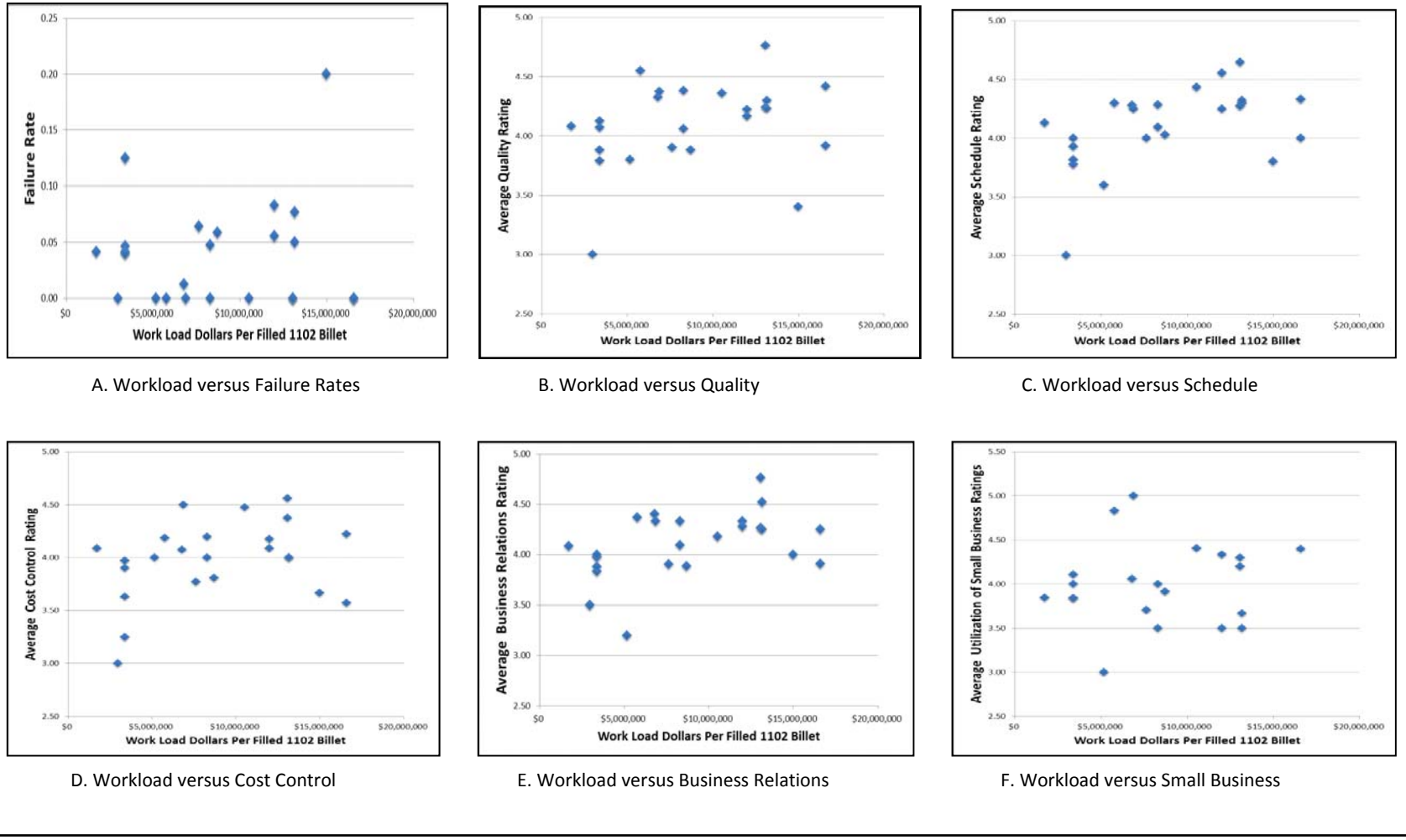
We determined a coefficient of correlation between each average performance and workload per filled billet. A positive correlation indicates that both workload and the performance measure increase together. In addition, we created scatter plots (see Figure 20) to visual analyze the relationship between workload per filled billet and each of the individual performance measures. The results from Fort Eustis in 2007 were excluded from both the correlation determination and the scatter plots since the workload per filled billet of $45 million was determined to be an outlier.

As reflected in the table and charts, the correlations, although not very strong, indicate that as workload dollars per filled billet increase, contractor performance ratings also increase, and thus contract failure ratings decrease. Although the correlations are not particularly strong, they do provide some interesting preliminary findings that deserve further exploration. This relationship could be explained by reasoning that the MICC with higher workload (dollars per filled billets) may not have the resources to ensure due diligence in conducting thorough contractor performance assessments and thus may be inflating the performance ratings. Another explanation may be that MICCS with higher workloads may have more experienced and competent personnel and more capable contracting processes that are resulting in better contracts and successful contractors. As previously stated, although these correlations are not particularly strong, they do provide some interesting preliminary findings that deserve further exploration in future research.

The next section summarizes our research, presents our conclusions, and identifies our recommendations.

Table 13. Workload (in Dollars) Per Filled Billet, Performance Ratings, and Failure Rates

MICC/Year	Workload($) by Filled Billet	Quality	Schedule	Cost Control	Business Relations	Management of Key Personnel	Utilization of Small Businesses	Failure Rate
Fort Sam 2008	$1,728,074	4.08	4.13	4.09	4.08	4.08	3.85	0.04
Fort Bragg 2012	$2,967,756	3.00	3.00	3.00	3.50	3.83		0.00
Fort Sam 2009	$3,390,218	4.07	3.93	3.97	3.98	3.98	4.11	0.05
Fort Sam 2010	$3,390,218	3.79	3.78	3.63	3.83	3.75	3.84	0.04
Fort Sam 2011	$3,390,218	3.88	3.82	3.90	3.88	3.81	3.84	0.04
Fort Sam 2012	$3,390,218	4.13	4.00	3.25	4.00	4.14	4.00	0.13
Fort Hood 2012	$5,163,911	3.80	3.60	4.00	3.20	3.40	3.00	0.00
Fort Eustis 2012	$5,768,758	4.55	4.30	4.19	4.37	4.28	4.83	0.00
Fort Eustis 2011	$6,790,396	4.33	4.28	4.07	4.41	4.32	4.06	0.01
Fort Bragg 2011	$6,871,488	4.38	4.25	4.50	4.33	4.38	5.00	0.00
Fort Hood 2011	$7,630,889	3.90	4.00	3.77	3.90	3.97	3.71	0.06
Fort Knox 2010	$8,292,513	4.38	4.29	4.20	4.33	4.24	4.00	0.05
Fort Knox 2011	$8,292,513	4.06	4.09	4.00	4.09	4.03	3.50	0.00
Fort Hood 2010	$8,696,449	3.88	4.03	3.81	3.88	3.76	3.92	0.06
Fort Eustis 2010	$10,528,404	4.36	4.43	4.48	4.18	4.58	4.41	0.00
Fort Hood 2008	$12,001,524	4.17	4.25	4.09	4.33	4.17	3.50	0.08
Fort Hood 2009	$12,001,524	4.22	4.56	4.18	4.28	4.11	4.33	0.06
Fort Eustis 2008	$13,065,094	4.76	4.65	4.56	4.76	4.76	4.20	0.00
Fort Eustis 2009	$13,065,094	4.24	4.27	4.38	4.27	4.48	4.30	0.00
Fort Knox 2008	$13,162,890	4.30	4.30	4.00	4.25	4.20	3.50	0.05
Fort Knox 2009	$13,162,890	4.23	4.32	4.00	4.52	4.25	3.67	0.08
Fort Bragg 2007	$14,976,974	3.40	3.80	3.67	4.00	4.25		0.20
Fort Bragg 2008	$16,586,239	4.42	4.33	4.22	4.25	4.42	4.40	0.00
Fort Bragg 2009	$16,586,239	3.92	4.00	3.57	3.91	3.70		0.00
Fort Eustis 2007	$45,646,866	4.00	4.10	4.11	4.20	4.20	4.00	0.00
	Correlations	**0.277**	**0.259**	**0.225**	**0.281**	**0.261**	**0.0434**	**-0.094**



A. Workload versus Failure Rates

B. Workload versus Quality

C. Workload versus Schedule

D. Workload versus Cost Control

E. Workload versus Business Relations

F. Workload versus Small Business

Figure 20. Workload Dollars Per Filled Billet Versus Individual Performance Measures

Summary, Conclusions, and Recommendations

Summary

Although the service sector represents the largest and the fastest-growing segment of the U.S. economy and comprises over half of the DoD's procurement dollars, poor management practices have undermined the government's ability to obtain best value in services acquisition. The DoD must give greater attention to proper procurement planning, source selection, and contract administration in acquiring services. The use of contractor performance information is a critical facet of services acquisition. During the source selection phase of the contract management process, specifically proposal evaluation, the DoD relies on the Past Performance Information Retrieval System (PPIRS) to obtain an offeror's past performance information, a required evaluation factor in source selections. Additionally, during the contract closeout phase, specifically after the contract period of performance, the DoD assesses the contractor's performance and reports this assessment in the Contractor Performance Assessment Reporting System (CPARS).

The objective of this research was to identify variables in the services contracting process that drive the success of services acquisition. Our research approach included analyzing contractor past performance data obtained from the DoD PPIRS database. We accessed the PPIRS database to collect contractor performance ratings on completed services contracts to determine whether the contracts are successful or not successful. Using statistical analysis to draw conclusions on whether certain contracting variables, type of service, contract dollar value, level of competition, and contract type affected the success of the contract, we generalized our research findings and provided recommendations for improving the Army's as well as DoD's services acquisition management. Our focus is to identify where the contract failures could be addressed, thus assisting DoD contracting officials. In presenting the conclusion of our research, we have to first assume that the awarded contract was proper (based on a fair and reasonable price and accurately reflecting schedule and performance requirements) in terms of the requiring agency's needs. With a properly awarded contract, the DoD can then perform the required contract administration activities in order to identify deficiencies with the contractor's work and ensure proper documentation into CPARS.

Conclusion

The following presents our research questions and related findings:

1. *Do the types of services being acquired affect the success of a service contract?*

The S type services (Utilities and Housekeeping) had the highest failure rate of all the product service codes analyzed. The S type services had 11 contract failures, resulting in a 3.77% failure rate. The reasons for contract failure included business relations and management of key personnel.

2. *Do the contractual amounts affect the success of a service contract?*
   Contracts with a dollar value from $50 million to $1 billion had the highest failure rate of all the contract categories. The contracts with dollar values between $50 million to $1 billion category consisted of 92 contracts, with eight labeled failures giving it a failure rate of 8.7%. This group's most common reason for failing was cost control.
3. *Does the level of competition used affect the success of a service contract?*
   Contracts awarded competitively had the highest failure rate when compared to the other two forms of competition available. Of the 540 competitive contracts, 17 were labeled as failures, which yield a failure rate of 3.15%. The reasons that most often resulted in a contract failure were in the areas of schedule and cost control.
4. *Does the contract type affect the success of a services contract?*
   Contracts structured as a combination contract had the highest failure rate when compared to the other five types of available contracts. There were four Combination contracts examined in the database. Of these four contracts, two were labeled failures, which yields a failure rate of 50.0%. Schedule and cost were both referenced twice in the failed contracts, while quality and management of key personnel were each referenced once.

We further analyzed our data to determine whether any of the variables had a significant relationship with contract success by specifically looking at the contract failure rates. We used the chi-square test (Fisher's exact test) to test if the actual failure rates are significantly different than what would be expected if the total contract failure rate was applied to each variable. The results of the chi-square test identified that Contractual Amounts and Contract Type were our only statistically significant variables.

Finally, we looked at the relationships between percentage of filled 1102 billets and failure rates, and between workload dollars per filled billet and failure rates and made some interesting observations. We saw that as the percentage of 1102 filled billets increased, the contract failure rate decreased. This would seem intuitive, that as the workforce increases, the contract success rate would also increase, since there would be sufficient resources to manage the contracting

process. However, we also observed that as workload dollars per filled billet increased, contractor performance ratings also increased, and thus contract failure ratings decreased. This relationship appears counterintuitive since any additional workload in the organization would place a higher demand on the workforce thus resulting in fewer resources to manage the contracting process. These two observations need further exploration using a much expanded contractor performance database.

Recommendations

The overarching goal in our services acquisition research stream is to identify the drivers of acquisition practices and their relationship to successful service contracts or, in other words, “What drives successful services contracts?” Our previous research indicated that the DoD defines and measures a successful services contract by analyzing the contract outcomes (performance, cost, and schedule). We used contractor performance as a surrogate measure for contract outcomes; that is, a successful contractor as reflected in the CPAR (in terms of quality, schedule, cost control, business relations, management of key personnel, and utilization of small business) would indicate a successful contract. Thus, our research used contractor performance ratings to determine if there was any relationship between contract variables and contract success. Based on our research, we provide the following recommendations for our more meaningful research findings.

Finding 1 stated that the S type services (Utilities and Housekeeping) had the highest failure rate of all of the product service codes analyzed. Although this finding was not statistically significant, it may indicate that contracting for utilities and housekeeping services may be more difficult than for the other service types. Perhaps the contracting agencies may need to place additional emphasis on procurement planning (developing the utilities and housekeeping services performance work statement [PWS]) as well as source selection (evaluation of offeror technical proposals). Additionally, increased emphasis during contract administration (contractor oversight and surveillance) may also improve the success of utilities and housekeeping services contracts.

Finding 2 shows that contracts with a dollar value from $50 million to $1 billion had the highest failure rate of all contract dollar value categories. The most common reason for these contract failures was due to cost control factors. This finding was found to be statistically significant and provides an indication that perhaps contracts in this dollar value range require additional management review and oversight during the procurement planning and source selection phases. The contracting agencies may not be providing adequate review for these higher value contracts in the areas of developing PWSs, cost estimates, budgets, and service delivery schedules.

Finding 3 identified that contracts awarded competitively had the highest failure rate when compared to contracts awarded non-competitively. The most common reason for these contracts failures was due to schedule and cost control factors. Although this finding was not statistically significant, it may indicate that additional emphasis may be needed in conducting competitive source selections. Perhaps the contracting agencies may need additional training in offeror proposal evaluation, specifically evaluating cost and technical proposals, as well as evaluating project schedules. The offeror's cost and technical proposals and schedule reflects the offeror's understanding of the contract requirements. If these proposals and schedules are not properly evaluated by trained source selection team members, the contractor may experience cost overruns and schedule delays.

Finding 4 identified that contracts structured as combination contracts had the highest failure rate when compared to the other five types of available contracts (CPAF, CPIF, CPFF, FFP, Other). This finding was found to be statistically significant and provides an indication that perhaps services contracts consisting of a combination of contract types are more complex and require additional management review and oversight during the contracting process. The contracting agencies may not be providing adequate review of these more complex contracts in the areas of developing PWSs, cost estimates, budgets, and service delivery schedules. In addition, the contracting agencies may need to provide additional training to the contracting workforce, specifically in the areas of dealing with combined cost type and fixed price services contracts.

Our final recommendation is based on Finding 8 which showed that as the percentage of 1102 filled billets increased, the contract failure rate decreased. Although this was not found to be statistically significant, it does show that as the agencies' contracting workforce increased, the contract success rate increased as well. Thus, our recommendation is that the contracting agencies strive to ensure that there are sufficient 1102 billets for each organization and that these billets are sufficiently filled with trained contracting professionals.

Our analysis of CPAR data identified some interesting areas worthy of further exploration. First, we would like to analyze an expanded database of services contracts, to include other services in addition to the four service types we initially researched. With the expanded database, we can analyze overall contract failure rates, as well as contract failure rates for our selected contract variables (type of service, dollar value, competition level, and contract type). Second, we would like to further explore the relationships between percentage of filled 1102 billets and contract failure rates, and between workload dollars per filled billet and contract failure rates. Expanding our contractor performance database to include other service types will provide the data integrity needed to identify any stronger

relationships among these contract variables. Finally, we would like to analyze the narrative portion of the contractor performance reports to determine alignment with the objective performance ratings, as well as the value added, not only in the narrative portions, but also in the usefulness of the CPARS as a contractor assessment tool.

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